

# Level 1 Contingency Planning

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# Should MODIS pursue contingency plan for producing Level 1 products?

- Launch is rapidly approaching
- A limited and discontinuous set of Level 1 products reached MODAPS during TESS and the first two MOSS 2 dry runs
- With a limited volume of Level 1, we will not meet our commitments for production of L2-L4
- We have yet to do an effective test of joint production with GSFC DAAC

# Details to consider

- GDAAC has demonstrated ability to make L1 products and deliver them to MODAPS but in limited volume and with numerous gaps
- So with regard to backups we must determine:
  - Is there an essential amount of L1 production below which a backup plan is required?
  - How important are gaps in the production?
  - When must these problems be solved by (MOSS 2, L+2 months...)?
  - If we think we want a backup: when must it be ready, how long will it take to develop, what resources are required, what would we give up to do it and how long do we keep it going?

# Backup approach: LZAARDS

- LZAARDS has not be dismantled
- ESDIS approval would be needed
- More testing of LZAARDS with MODAPS needed
- DPREP would need to run in MODAPS and mods to make it more robust would still be required
- Any problems with EDOS production of PDS would still be there
- Resources needed to run L1 PGEs

# Backup approach: EDOS Rate Buffer

- Approach taken by NOAA and we might be able to use their software
- We would have to deal with:
  - Packets not time ordered
  - Duplicate packets not removed
  - Packet headers on each packet
- DPREP still required
- Resources also needed to run L1 PGEs

# Backup approach: EDOS bent pipe

- EDOS sends PDSes (Production Data Sets) to MODAPS and GDAAC
- GDAAC archives the L0
- MODAPS makes the L1 products
- Still need DPREP problem to be solved
- Eats up resources to run L1 PGEs

# Backup approach:

## GDAAC provides DPREPed L0

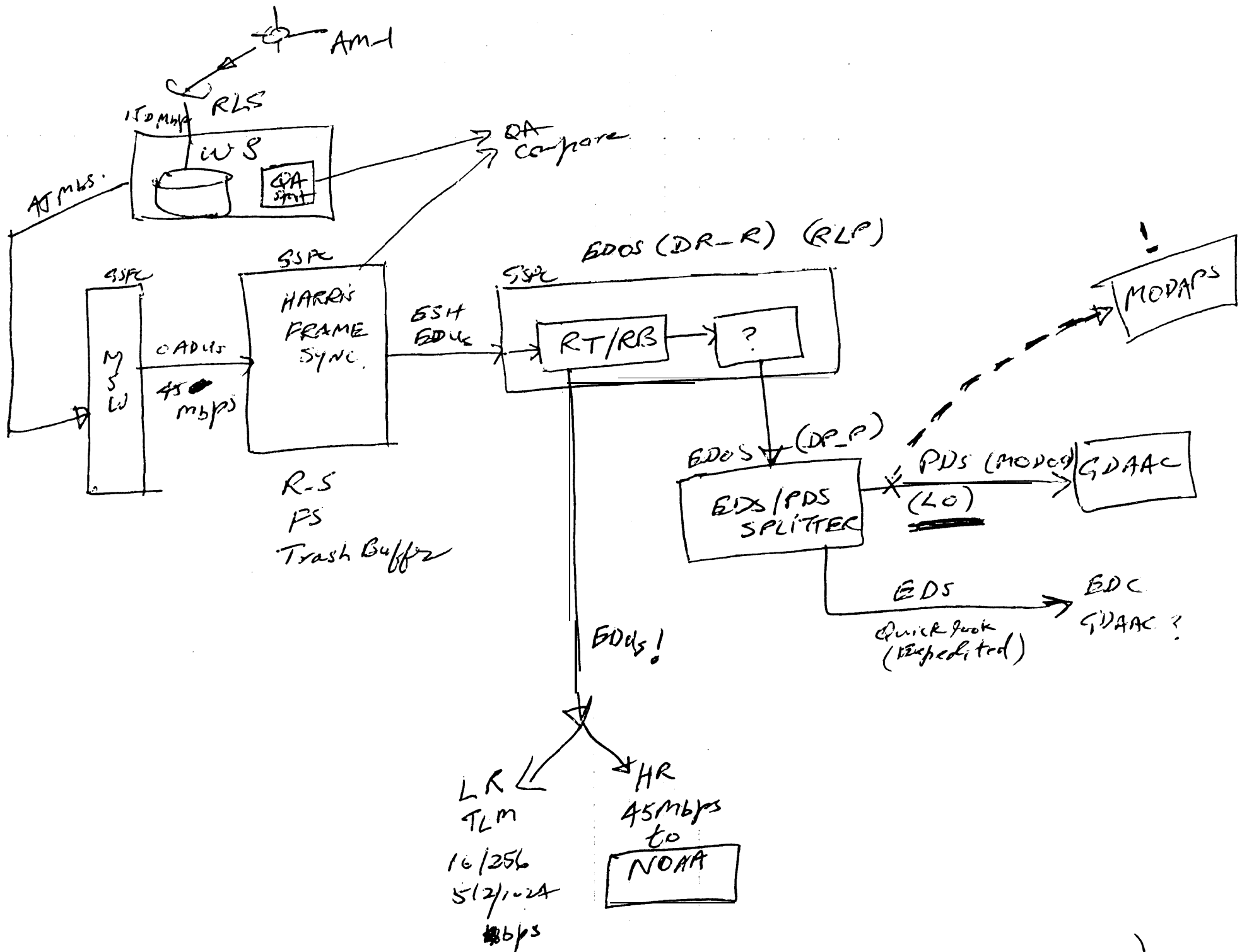
- Makes sense if L1 processing fails or distribution is limited but all DPREPed L0 can be sent to us
- DPREP not required in MODAPS
- Still uses up resources to run Level 1 PGEs

# Final questions

- Do we need/want a backup?
- How long can we wait to decide?
  - When is it needed and how long to develop it?
- What do we want it to do?
  - Make 10% (purely an emergency backup)
  - Make 100% of Level 1 at expense of other products



# Backup Slides



## EDU

- EDOS specified structure

- Variable length Delimited

- SDU + ESH  
(VEDU + ESH) = EADU

⊖ (Pre-Level 0)  
LO-R (air)

↓  
NOAA

## Expedited Data Set (EDS)

- By  
• SCID + APID

- Quick look Flag.

- Forward Time order

- Data Groups Identifient.

- QA information.

⊖ No Data Merging.

⊖ No Redundant Packet deletion -

EDS  
• Construction Record.



EDC

+

GDAAC (?)

## Production Data Sets (PDS)

- ✓ Sorted by SCID + APID

⊖ No Quick look Flag

✓

✓

✓

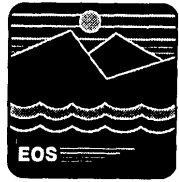
⊖ ✓

⊖ ✓

✓ PDS Construction Record.

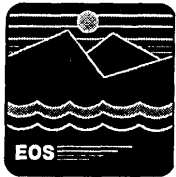


GDAAC

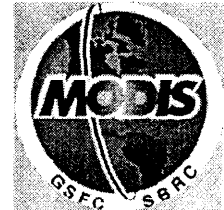


# ***CONTINGENCY PLAN for L1 GENERATION***

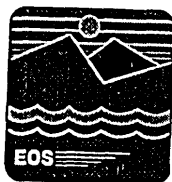
Shirley M. Read, SAIC GSC  
PI Processing Meeting  
**July 13, 1999**



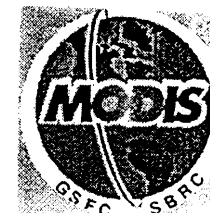
## *Options for Contingency Plans*



- Option 1: MODAPS performs Level 1 Processing, but not Dprep Processing, using input from the GSFC DAAC.
- Option 2: MODAPS performs Dprep Processing and Level 1 Processing using input from the GSFC DAAC.
- Option 3: MODAPS performs Dprep Processing and Level 1 Processing using input from external data providers.
- Option 4: MODAPS performs Level 1 Processing using Level 1 S/W from NOM (**onsite** GSFC), Level 0 **RT/RB** data from EDOS, and ancillary data from external data providers.



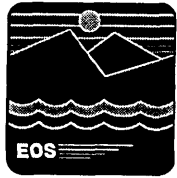
# ADDITIONAL REQUIREMENTS and ACTIVITIES for CONTINGENCY PLAN OPTIONS



Requirement or Activity	Option 1	Option 2	Option 3	Option 4
Revise SIPS ICDs and MOUs	X	X	X	X
Nrite MODAPS - EDOS/LZAARDS ICD			X	X
Nrite MODAPS - FDD ICD			X	X
Nrite MODAPS - Larry server ICD			X	X
Nrite MODAPS - DAO ICD			X	X
Nrite MODAPS - Miami Oceans ICD for MOD01 SS	X	X	x	X
Nrite MODAPS - Validation Sites ICDs for MODVOLC	X	X	X	X
Nrite MODAPS - MCST ICD for L1 B Products for QA	X	X	X	X
Obtain and run Dprep S/W from ECS		X	X	X
Test and run Dprep with MODIS PGEs in MODAPS		X	X	X
Revise and implement MODAPS Ingest Operational Procs	X	X	X	X
Revise and Implement MODAPS Export Operational Procs	X	X	X	X
Implement Export of L1 B to Miami Oceans	X	X	X	X
Implement Export of MODVOLC to validation sites	X	X	X	X
Implement Export of L1B to MCST for QA	X	X	X	X
Revise MODAPS Ingest S/W for attitude and ephemeris		X	X	X
Revise MODAPS Ingest S/W for external ancillary data			X	X
Revise MODAPS Ingest S/W for DAO ancillary data			X	X
Revise MODAPS Loaders & related data processing S/W	X	X	X	X
Revise MODAPS archive and transfer S/W	X	X	X	X
Revise MODAPS Database Tables	X	X	X	X
Configure Clearcase VOB & CM S/W and data	X	X	X	X
SSTG test and deliver Dprep S/W		X	X	X
Test Team extend I&T and IV&V testing	X	X	X	X
Add disks and tapes for new data types	X	X	X	X
Revise network/servers for data export	X	X	X	X
Reconfigure T3 line to MCST	X	X	X	X
Write MODAPS - EDOS ICD for Level 1 rate buffered data				X
Obtain and adapt NOAA version of Level 1A and Geo S/W				X
Test and run adapted NOAA Level 1A/Geo S/W				X

SDST

July 13, 1999



## *Summary of Additional Requirements and Activities*



- New and Revised ICDs and MOUs.
- MODAPS Dprep Processing of Attitude and Ephemeris Data.
- MODAPS Level 1 Processing.
- MODAPS Core Software Changes.
- SDST Software Changes.
- Hardware Resource Changes.
- Adapt NOAA Processing to MODAPS.



## *New and Revised ICDs and MOUs*



- Write new MODAPS - EDOS | LZAARDS ICD for MODAPS to obtain MOD00 and raw **AM1EPHN0**.
- Write new MODAPS - FDD ICD for MODAPS to obtain raw **AM1ATTNF**.
- Revise ECS SIPS **ICDs** and **MOUs** for MODAPS to import MOD00 from GSFC DAAC; to export **MOD01**, **MOD03**, **MOD021KM**, **MOD02HKM**, **MOD02QKM**, **MOD02OBC**, **MOD35\_L2**, **MOD07\_L2**, and **MODCSR\_D** to GSFC DAAC.
- Write new MODAPS - GSFC **larry** Server ICD for MODAPS to obtain NOAA, NASA, US Navy, and NISE ancillary data.
- Write new MODAPS - **DAO** ICD for MODAPS to obtain DAS ancillary data sets.





## *New and Revised ICDs and MOUs (Continued)*



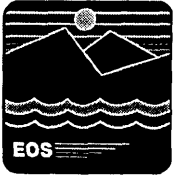
- Write MODAPS - Miami Oceans MOU for MODAPS to export **MOD01SS** to Miami.
- Write MODAPS - Validation Sites **MOUs** for MODAPS to export MODVOLC to validation sites. (Time for receipt of data at validation site determined this option rather than export MODVOLC to GSFC DAAC for distribution.)
- Write MODAPS - MCST 'MOU for MODAPS to export fraction of **L1B** products for QA over T3 line. (Time is critical.)



## *MODAPS Dprep Processing of Attitude and Ephemeris Data*



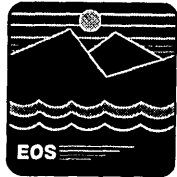
- MODAPS obtain Dprep Software from ECS.
- Obtain simulated raw AM1ATTNF from FDD and simulated raw AM1EPHNO from EDOS | LZAARDS.
- Build and install Dprep Software on MODAPS and test with simulated raw **AM1ATTNF** and AM1EPHNO data.
- Run output of Dprep through **PGE01** and PGE02 to validate this output data and compare to simulated “**Dprepped**” data.
- Conduct external interface test with FDD and EDOS | LZAARDS to receive raw attitude and ephemeris data and process from Dprep through at least **PGE03**.



## ***MODAPS Level 1 Processing***



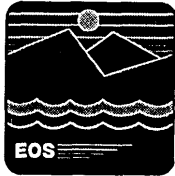
- MODAPS Acceptance Test of Dprep Software with MODIS Science Data Processing, **Software**.
- MODAPS Operations adds execution of Dprep, **PGE01**, **PGE02**, **PGE03**, **PGE55**, and **PGE71** to the MODAPS Data Processing System.
- MODAPS revises procedures to add the Ingest of raw attitude data, raw ephemeris data, and LO and to delete the Ingest of **L1A**, Geolocation, Cloud Mask, Atmospheric Profiles, and Clear Sky S-day running composite.
- MODAPS revises procedures to add the Export of “**Dprepped**” attitude and ephemeris data, **L1A**, Geolocation, Cloud Mask, Atmospheric Profiles, and Clear Sky Daily to the GSFC DAAC.
- MODAPS adds export of volcano alert to validation sites, subsetted **L1A** to Miami; and **L1B** to MCST for QA.



## ***MODAPS Core Software Changes.***



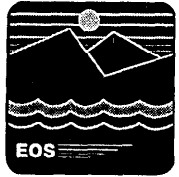
- Revise MODAPS Ingest System to obtain raw AMIATTNF from FDD, MOD00 and **AM1EPHN0** from EDOS |**LZAARDS**, ancillary data from larry Server, and DAS from **DAO** Server.
- Revise MODAPS Export System to export **MOD01**, MOD03, AMIATTNF, AMIEPHNO, **MOD021KM**, **MOD02HKM**, **MOD02QKM**, **MOD02OBC**, and MODCSR D to GSFC DAAC; **MOD01SS** to Miami; MODVOLC t&Validation Sites, and selected **L1B** data to MCST.
- Revise Loaders and related data processing S/W to run Dprep, **PGE01**, PGE02, PGE03, PGE71, and PGE55.
- Revise Archive S/W to store/archive additional data sets.
- Revise MODAPS Database Tables and S/W to handle new data.



## ***SDST Software Changes***



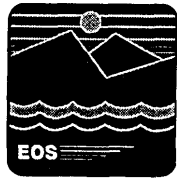
- CM configure Clearcase VOB for Dprep, PGE55 and **PGE71** at all stages and add **PGE01**, PGE02, and PGE03 to operations.
- SSTG receive Dprep **Software**, unit test and deliver to CM for baseline. Coordinate with MODAPS for adding **PGEs** to Loader/Recipe and **ScheduledPGEs**.
- I&T Team revise test procedures, test Dprep, and do extended testing of **PGE01**, PGE02, PGE03, PGE55, and **PGE71**.
- IV&V Test Team revise test procedures and perform acceptance test on above S/W.



## *Hardware Resource Changes*



- Additional disks and tapes for MOD00, raw **AM1EPHN0**, raw **AM1ATTNF**, **MOD01SS**, **MOD02OBC**, MODVOLC, MODCSR G, and MODCSR\_D. May require additional disks and tapes for **MOD01**, **MOD03**, MOD35\_L2, MOD07\_L2, and MODCSR\_8.
- Revise network configuration/servers to handle import/export to GSFC DAAC and export to Miami and validation sites.
- Reconfigure T3 line from MODAPS to MCST.



## *Adapt NOAA Processing to MODAPS.*



- Write MODAPS - EDOS ICD for Level 1 real-time, rate buffered (**RT/RB**) data.
- Write MODAPS - NOAA MOU for MODAPS to obtain NOAA's adapted version of Level **1A** and Geolocation S/W.
- Obtain Level 1 **RT/RB** MODIS Level 0 and AM1 ephemeris test data from EDOS. Type and source of AM1 attitude data are TBD.
- Obtain and adapt NOAA version of Level **1A** and Geolocation S/W from On-site GSFC NOM.
- Build, install, and test adapted NOAA **L1A** and Geolocation S/W on MODAPS.
- Conduct external interface test to receive MODIS LO and AM1 ephemeris **RT/RB** data from EDOS, receive **AM1ATTNF** data from FDD or TBD from EDOS, and process data through adapted NOAA Level **1A/Geolocation** S/W.